Q. **2013 General Rate Application, Cost of Service**

Exhibit 9, Section 1.5 - Classification states that each functionalized cost group is separated into demand, energy and customer-related components based on the predominant factor for cost causation. Provide a detailed explanation of the process to develop each of these predominant factors, including all supporting workpapers, data and calculations in Excel format.

A. Hydro's classification ratios are based on the Board's recommendations contained in its report on Hydro's Cost of Service Methodology, dated February 1993. A copy of this report is attached as Attachment 1.

Details related to the generation and transmission functional classification ratios, shown on Exhibit 13, Schedule 4.1, page 1, are on the attached table (as Attachment 2). The detailed calculations are included in the electronic Cost of Service Study filed in response to NP-NLH-130.

Details related to the distribution functional classification ratios, shown on Exhibit 13, Schedule 4.1, page 2, have been provided in response to PUB-NLH-127.

REPORT

OF

THE BOARD OF COMMISSIONERS OF PUBLIC UTILITIES

TO

THE HONOURABLE MINISTER OF MINES AND ENERGY

GOVERNMENT OF NEWFOUNDLAND AND LABRADOR

ON

A REFERRAL BY NEWFOUNDLAND AND LABRADOR HYDRO

FOR

THE PROPOSED COST OF SERVICE METHODOLOGY

AND

A PROPOSED METHOD FOR ADJUSTING ITS RATE STABILIZATION PLAN TO TAKE INTO ACCOUNT THE VARIATION IN HYDRO'S RURAL REVENUES RESULTING FROM VARIATIONS IN THE RATES SET BY THE BOARD TO BE CHARGED BY NEWFOUNDLAND LIGHT & POWER CO. LIMITED TO ITS CUSTOMERS

FEBRUARY 1993

BEFORE:

R.E. Good, Chairperson
L.E. Galway, C.A., M.B.A., Commissioner
G.R. Vey, R.P.A., Commissioner

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PART I - INTRODUCTION

In its report to the Minister dated April 13, 1992, following a hearing concerning rates to be charged by Newfoundland and Labrador Hydro (Hydro), the Board recommended, inter alia, that:

(1) Hydro's proposed cost of service methodology be used until it is examined more fully at another hearing. The Board will set a date for such a hearing after discussions with the interested parties.

(2) Hydro and Newfoundland Light & Power Co. Limited (NP) develop an acceptable rate form for review by the Board, at the hearing to be held on Hydro's cost of service methodology.

(3) At the hearing on Hydro's cost of service methodology Hydro present for the consideration of the Board a provision to be included in the Rate Stabilization Plan (RSP) requiring that the RSP be credited with the additional revenue received by Hydro as a result of NP's rate adjustments.

The Referral

Pursuant to the foregoing recommendations, on June 26, 1992, Hydro referred to the Board:

(1) The proposed cost of service methodology; and

(2) A proposed method for adjusting its Rate Stabilization Plan to take into account the variation in Hydro's rural revenues resulting from variations in the rates set by this Board to be charged by NP to its customers.

At that date the prefiled evidence of Hydro was made available to interested parties.

In its referral, Hydro sought approval of the cost of service methodology outlined in its evidence, effective for use in its next rate hearing, and in the interim, permission to use the methodology approved in the Board's April 1992 report.

Hydro further presented specific provisions for adjustment of its RSP, which were proposed to apply to all alterations (increases and decreases) of NP rates, effective for the next NP rate alteration.

The referral did not include proposals for a three-part rate. In evidence, Hydro stated that a joint (Hydro, NP) report would be filed with the Board by November 15, 1992.

The Hearing

Forthwith upon receipt of Hydro's Referral the Board ordered a hearing, the first phase thereof being held in the Board's Hearing Room on July 17, 1992. Phase I was held to assist interested parties, to discuss problems and procedures related to the filing of Demands for Particulars and to establish procedures as to time of sitting and order of questioning. It was determined that Phase II of the hearing would commence on September 14, 1992.

Both Phase I and II Hearings were held after due public notice.

The Board retained George C. Baker, P.Eng., as its Engineering Consultant and R. G. Noseworthy, C.A., as its Financial Consultant.

Phase II hearings were held in the Board's Hearings Room in St. John's on September 14, 16, 17, 18, 21 and 22, 1992.

The Board received interventions from the Consumer Advocate, NP, Abitibi Price Inc. (Abitibi), Deer Lake Power Company Limited, Corner Brook Pulp and Paper Company Limited, Newfoundland Processing Limited, Alvin Hewlett, M.H.A., District of Green Bay, The Towns of Labrador City and Wabush and The Innu Nation (sometimes hereinafter referred to as the Intervenors).

Geoffrey P. Young, LL.B., appeared on behalf of Hydro.

Jeffrey K. Brace, LL.B., was present as the Consumer Advocate.

Joan F. Myles, LL.B., appeared on behalf of NP.

Janet M. Henley Andrews, LL.B., appeared on behalf of Abitibi, Deer Lake Power Company Limited, Corner Brook Pulp and Paper Company Limited and Newfoundland Processing Limited (Industrial Customers).

Edward M. Hearn, Q.C., and Joseph Hutchings, LL.B., appeared on behalf of the Towns of Labrador City and Wabush.

During the hearing, the Board was assisted by its Counsel, Sean Hanrahan, LL.B., and its Engineering Consultant.

Hydro's argument was filed October 7th., the Intervenors filed their arguments on October 23rd. Hydro's rebuttal was filed on November 4th.

Evidence was given by the following:

Hydro

Derrick F. Sturge, Director of Rates and Financial Planning,

Dr. Robert H. Sarikas, Senior Consultant & Senior Vice-President, Foster Associates Inc., Washington, D.C.;

Richard A. Bellin, Affiliate Consultant, Foster Associates Inc., Washington, D.C.,

NP

Larry B. Brockman, Vice-President in the Consulting Department of Energy Management Associates, Inc., Atlanta, Georgia;

Abitibi

Jack Verhoeven, Manager, Abitibi Price, Inc., Stephenville,

E. Odgers Olsen, Jr., Partner, Ernst & Young's Utilities Consulting Practice, Washington, D.C.;

The Board

George C. Baker, Consulting Engineer, Kentville, N.S.

PART II - SUMMATION, POSITION OF PARTIES, CONCLUSIONS AND RECOMMENDATIONS

COST OF SERVICE STUDIES

Cost of service studies are routinely and almost universally used in rate proceedings to determine the cost responsibility of the various customer classes. In broad outline the procedures used have become highly standardized. They comprise (1) identification and segregation of costs directly attributable to any particular class, (2) arrangement of the remaining costs so that they can be allocated to the various groups of customers which are jointly responsible for the incurrence, and (3) allocation of such costs in accordance with physically measurable attributes of the services provided to customer classes. (NARUC Cost Allocation Manual; 1973 ed.)

Exhibit 1 on the page opposite provides a flow chart of cost of service studies.

Costs identified in the first of the above steps are directly assigned to the classes responsible. In the second step, the costs are segregated in two ways. They are first separated in accordance with the utility function for which the costs were incurred. The major functions are generation, transmission and distribution. This procedure is called "functionalization". The functional costs are then further separated according to the electric service attributes deemed responsible for their incurrence. The attributes used are class demand, energy use and number of customers served. This procedure is called "classification".

In the final step, the classified costs are allocated to rate classes in proportion to class demands, energy use and number of customers.

Cost of service studies are of two types. Embedded cost studies allocate the Utility's revenue requirement, while marginal cost studies allocate the costs of marginal consumption. Hydro's study is of the embedded type.

Expert testimony offered by the parties accepted these cost of service features as being normal and appropriate. However, within this overall structure many methodological variations are possible, and these gave rise to differences of opinion. The issues arising therefrom are discussed in subsequent sections of the report.

Cost of Service Objective and Principles

Where methodological variations exist, what criteria should be used to make a choice between them? On this question there were some differences of opinion. Dr. Sarikas' views were stated as follows in response GCB-14 (a):

> "A cost study is not regarded as an end in itself. Thus the objective is not merely to reflect, as accurately as possible, cost causation in the Newfoundland and Labrador System. Objectives relate to rate design and not to cost analysis. Cost analysis is regarded as a tool for rate design. Rate design involves balancing a number of objectives. The most significant of these objectives is fairness and economic efficiency."

In the response, rate design objectives were said to include: meeting the revenue requirement, fairness, economic efficiency, simplicity and ease of understanding, conservation of resources, stability and gradualism, social goals, administrative ease, employment, and protection of the environment.

NP's expert, Mr. Brockman, stated that:

"Bonbright's principle of fairness in the apportionment of costs and the NARUC principle of attributing costs based upon how customers cause costs to be incurred, are inextricably intertwined. In fact, the principle of causality (or cost causation) is almost universally claimed in attempts to justify various costs of service methodologies as fair."

The Board's consultant testified that equity, or fairness, based on causal responsibility or user-pay considerations, would constitute a sufficiently broad criterion for the selection of appropriate methodology.

The Industrial Customers argued (Final Argument, P. 49) that efficiency is also an important consideration.

The opinions expressed are unanimous in supporting fairness as a criterion, but differ on the extent to which other considerations should be taken into account.

The Board is of the opinion that efficiency in the consumption of electric energy is important and should be encouraged to the extent possible.

However, as Dr. Olsen explained in his evidence, economic theories on efficiency require the use of marginal cost rates, and are based on assumptions which do not hold in the case of a regulated monopoly such as Hydro. He concluded that an embedded cost of service study should be used. No other expert witness disagreed.

The Board notes that the costs to be recovered through rates are Hydro's embedded costs, not its marginal costs, and therefore concludes that an embedded cost of service study is appropriate.

Within the limitations imposed, it is the Board's opinion that economic efficiency is best promoted by the allocation of costs on a causal basis. If other rate considerations should impose a need for compromise, the required adjustments may best be achieved in the process of rate design.

Recommendation 1:

That Hydro's Cost of Service Study be of the embedded type and that the methodological objective be to allocate costs to rate classes in a fair and equitable manner based on causal responsibility for cost incurrence.

Hydro's Cost of Service Study

To exemplify its proposed methodology, Hydro calculated the cost responsibility of customer classes using 1992 forecast data and presented the results in Exhibit RAB-1. For that purpose Hydro divided its customer classes into three groups:

1. The Island Interconnected System, comprising Newfoundland Power, Industrial customers served directly by Hydro, and nine classes of Rural customers;
2. The Labrador Interconnected System, comprising two Industrial and seven classes of smaller customers; and
3. Isolated Systems, comprising eight customer classes.

For each group, a fully distributed cost of service study was performed. Hydro's head office and other overhead costs were split between the three groups on a causal basis and formed part of the revenue requirement in each case.

The Towns of Labrador City and Wabush (the Towns) submitted that while the proposal to regard Labrador Interconnected as a single region for the purpose of a cost of service study designed to produce rates for retailers and isolated systems may not be objectionable, the Towns do not concede that this cost of service study is sufficient to produce rates for customers in Labrador; that two or three separate studies may be needed before such rates are set.

In rebuttal, Hydro took the position that the present hearing was intended to be all inclusive for all parts of the province regulated by the Board; that if cost of service methodology were intended to be dealt with at each rate hearing, a generic hearing on such matters would have been wasteful at best; that one cost of service study as presented in Hydro's prefiled evidence should be required for the Labrador Interconnected area, and that this should be the basis for future rate design in Labrador.

No other parties contested the regional structure adopted by Hydro, or the use of a single cost of service study for each of the three regions.

The Board agrees with Hydro's view that questions of cost of service methodology should be settled as a result of the present hearing. The Towns have not submitted any evidence or arguments to show that costs in Labrador Interconnected System are not appropriately allocated by means of a single cost of service study, or that the rate class structure adopted by Hydro for that system is inappropriate. The Board is not aware of any instance where more than one embedded cost of service study has been deemed necessary for a single interconnected system and moreover considers that all customers served within the Labrador Interconnected System share common costs of generation, transmission and a variety of overheads. It therefore concludes that a single cost of service study is appropriate for that system.

Recommendation 2:

That the structure adopted by Hydro for cost of service purposes comprising one study for the Island Interconnected System, one for the Labrador Interconnected System and one for all Isolated Rural Systems be approved.

SPECIFIC ASSIGNMENT OF TRANSMISSION PLANT

Prior to amendment of the Electrical Power Control Act, rural and isolated customers were served through the Board of Trustees of the Newfoundland and Labrador Power Distribution District (PDD), which constituted a single customer class for purposes of Hydro's cost of service studies.

A recommendation of the Board in its 1978 report established the principle that costs relating to plant and equipment dedicated to the service of a single customer should be specifically assigned to that customer, while costs of plant and equipment of substantial benefit to more than one customer should be apportioned between all customers. Pursuant to this recommendation, costs relating to all transmission lines serving the PDD exclusively were directly assigned to the PDD.

When the Electrical Power Control Act was amended to eliminate the PDD, all its customers, numbering more than 26,000, became customers of Hydro. For purposes of rate design, Hydro divided these customers into numerous classes according to the size and nature of their loads.

Under its proposed cost of service methodology, Hydro then treated the transmission lines serving the former PDD as common plant and allocated the costs between all customer classes.

NP and Industrial Customer (IC) witnesses took the position that nothing had changed but semantics: that in fact the lines in question still served Hydro's rural customers and that there was no need to treat them as common. The Board's consultant suggested that a sub-transmission function could be used in order to allocate the lines to the classes they served, but raised the question whether other transmission, jointly used by NP and IC, was treated as common and allocated in part to Rural classes.

Based on evidence that Howley-Cat Arm line supplies station service to the Cat Arm Generating Station, both NP and IC agreed that that line should be treated as common.

Regarding the remaining lines, Hydro submitted that each Hydro rural class is separate and distinct; that the concept of a single Rural class has no basis in fact; that arguments to the contrary rely on historical circumstances; that there is no precedent for long-term reflection of pre-existing conditions in costing methodology; and that Hydro correctly followed the Board's 1978 recommendation in treating the lines as common.

NP submitted that Hydro Rural was a single customer class under the Board's previous guidelines and there was no need to change them; that while Hydro Rural constituent classes need to be recognized for purposes of rate design, Hydro Rural remains a single class, as does NP vis a vis Hydro's overall cost of service. NP further argued that Hydro's approach would assign costs to NP and Industrials for lines serving only Rural Customers and that this contradicts the prefiled testimony, Page 9, Lines 1-4 of Dr. Sarikas, that each customer class should be allocated only those functions used in supplying service to it. (NP Final Argument, P. 3-4).

In rebuttal, Hydro asserted that Dr. Sarikas refers to assignment as classification, not functionalization, and there are no instances where he has proposed functionalizing plant to a customer who does not use that kind of plant.

The IC submission took a neutral position, recommending that the lines should be treated as the Board sees fit.

Direct assignment of cost entails diverting the assigned costs from the normal steps of cost of service analysis and charging them directly to the responsible class. (See Exhibit opposite Page 5 of this Report) If the cost responsibility is shared by more than one class, and the normal means of splitting such costs have been by-passed, extemporaneous measures would be necessary to distribute the assigned costs between the responsible classes. For this reason, direct assignment should be used only in the case of plant dedicated to the use of a single class. In the Board's opinion the criterion established in 1978 remains appropriate. With several classes of Rural customers, Hydro's decision to avoid direct assignment was proper.

However, the Board is not persuaded that the conversion of Rural Customers from one class to several should result in changing the costs allocated to NP and IC. The 1973 NARUC Cost Allocation Manual (P. 6-7) indicates that this sort of problem is often encountered: "Frequently the analyst is required to divide costs within a function to recognize non-utilization of certain facilities within the function by one or more customer groups." The manual then states that under such circumstances, sub-functions are used to ensure that the costs are borne by the classes responsible.

The 1992 NARUC Electric Utility Cost Allocation Manual also addresses briefly the subfunctionalized transmission plant method on Pages 71-72. The Board has noted the work required to implement such subfunctions is dependent upon the scale of subfunctionalization that takes place. The 1992 Manual indicates detailed plant accounts and schematic diagrams are required and where necessary subjective judgement when a function is not clear. In the opinion of the Board it will not be necessary to use micro-allocation methods since the refinement should not go beyond complete substations and complete line segments.

The Board considers that the cost of transmission lines dedicated to the service of Rural classes be included in a sub-transmission function and allocated to such classes. The principle that costs should be allocated to classes only for the facilities used by such classes would justify a second sub-transmission function for common lines used by NP and IC but not by Hydro Rural, provided the costs relating thereto were significant.

Recommendation 3:

That the Howley-Cat Arm transmission line be treated as common.

Recommendation 4:

That transmission lines dedicated to the service of Hydro Rural rate classes be included in a sub-transmission function, and the costs attributed thereto be allocated exclusively to such classes.

Recommendation 5:

That the methodology indicated in recommendation 4 be applied in the case of transmission serving both NP and IC but not the Rural classes, provided the costs total at least 2% of total transmission costs.

Recommendation 6:

That with the exception of the plant affected by recommendations 4 and 5, Hydro's method of functionalization be approved.

ALLOCATION OF GENERATING PLANT

Fixed costs relating to generating plant may be attributed to both the demand placed on the system and the energy requirement. The proportions in which such costs should be split between demand and energy classifications was a controversial issue. All expert testimony agreed that some component of energy cost exists, but individual estimates of the correct proportion varied widely.

Moreover, it was Dr. Sarikas' position that the Average and Excess (AED) method of allocation, which he proposed to use for generation, would result in further recognition of energy costs. This meant that the classification issues could not be considered in isolation. Dr. Olsen and Mr. Brockman agreed that the AED method does involve energy recognition. The Board's consultant disagreed. In view of the possible interrelated effects of classification and allocation the Board will first discuss allocation and related issues.

The Average & Excess Demand (AED) Method and Energy Recognition

There was considerable debate during the hearing as to whether or not the AED method in fact recognizes energy. Dr. Sarikas, Mr. Brockman and Dr. Olsen all believe that there is an energy recognition effect due to the application of the AED method. All three of these expert witnesses expressed some concern that this effect had to be taken into account when choosing the appropriate methodologies for a cost study. Mr. Baker makes it clear that it is his firm position that the AED method does not recognize energy.

Hydro argued that while the difference of opinion between Mr. Baker and other experts may not be resolved at this hearing there is de facto recognition between the most important classes:

(a) AED raises the cost of the higher load factor Industrial class and lowers the cost of the lower load factor NP (Argument, October 7/92, P. 23).

(b) Although the lowest load factor Rural class is a counter-example, having higher costs, this is immaterial because the increased rural deficit will in any case be shared by the other two classes (Argument, October 7/92, P. 24).

(c) Thus regardless of whether the effects are due to user-pay, etc., the result is reasonable and Dr. Sarikas's classification of thermal base load 100% to demand is sound (Argument, October 7/92, P. 22-23).

The Industrial customers argue that it is easy to get lost in all the highly technical mathematical formulae involved in the AED method, (Final Argument, P. 28) but:

(a) Mr. Baker admits numbers change as load factor changes; also higher load factor customers attract more cost under AED than under CP (Transcript, p. 470).

(b) Three of four experts, plus the NARUC manual, say AED has an energy component (Final Argument, P. 27).

(c) The bottom line is that the method allocates more cost to high load factor customers, as compared to the CP method, for whatever reason (Final Argument, P. 28).

Discussion

The Board first examines the extent to which the AED method of allocation is a substitute for classifying a part of generation fixed cost to energy. A majority of the expert witnesses who testified consider that AED provides at least some energy weighting. The Board's consultant, who did not share that opinion, nevertheless agreed that under an AED allocation an increase in load factor would result in a larger cost allocation (Transcript, P. 470).

On the other hand, Hydro conceded in its submission that while an AED allocation provides a greater allocation for the high load factor Industrial class, the Hydro Rural classes provide a counter-example.

Dr. Olsen testified that "the procedure used by Dr. Sarikas results in approximately 75% of the costs of the hydraulic facilities being allocated on energy" (prefiled, p. 9). IC submitted that Dr. Sarikas had admitted the net result of his classification and allocation choices is a 73% energy/27% demand split. Having reviewed the transcript (p. 109), the Board is not persuaded that this is a correct interpretation. Dr. Sarikas agreed to the 73% figure, but Mr. Bellin's subsequent clarification is significant:

> "Although the final dollars may reflect that the other side of this is the final classification of demand cost and energy cost and the costs which are classified as energy are still the 56%, or 50%, if you will, on your example."

In GCB-21, Hydro was asked to quantify Dr. Sarikas' testimony that the AED method gives "substantial weight" to energy. The response was that in the end result only about 22.7% of total plant is allocated using excess demand factors. Dr. Sarikas repeated his answer verbatim on cross-examination. The answer does not resolve the question for the Board because it omits the effect of the average demand allocation which, according to Exhibit GCB-1, is identical with a CP allocation.

The Board has also examined Exhibit IC-2, which shows allocated costs under both AED and CP methods for a range of classifications to energy. The results show that for the Industrial class the AED allocation with a 0% classification to energy is greater than the allocation on CP with a 3% classification to energy but very much less than allocation on CP with a 44% classification to energy. This comparison suggests to the Board that if the AED method provides energy recognition, it does so to a far lesser degree than does classification to energy under a CP allocation.

Moreover, the Board observes that for the Rural classes, allocated costs are substantially increased by an AED allocation. These classes have a combined load factor lower than either NP or IC. This comparison would therefore suggest that the AED method provides negative energy recognition.

From its examination of IC-2, the Board concludes that if indeed the AED method confers energy recognition it does not do so to an equal extent for all classes.

After giving due weight to both expert testimony and the data provided in the course of the hearing, the Board finds that the evidence available to it on the degree of energy recognition provided by the AED is inconclusive.

Allocation of generation demand costs

Hydro proposes to use the AED method of allocating generation demand cost. Dr. Sarikas said he had recommended it because it provides recognition of load factor and takes into account the energy relationship of base load generating plant investment, adequate load data is available to calculate allocation factors, and the method has prior regulatory acceptance in Newfoundland (prefiled, p. 17). He also testified that the CP method makes no user-pay charge for off-peak demand (prefiled, p. 15).

In its submission, Hydro argued that the AED method also tempers what might otherwise be too great a classification of generation fixed cost to demand.

NP recommended allocation by the 5 coincident peak (5 CP) method on the basis that basing peak demand responsibility on multiple peaks would provide a better measure of class contribution to loss of load probability.

IC recommended use of the AED method provided the plant classified 100% to demand, arguing that this combination would result in 56% of the cost being based on energy use. IC further argued that AED plus classification split constitutes double-counting; that Dr. Sarikas admitted the result of his proposal would be a 73%/27% split for hydraulic generation costs; that BC, Manitoba, Ontario and New Brunswick use a classification split but not AED; and that AED does allocate more cost to Industrials than CP.

Discussion

In its submission, Hydro anticipated that the question of AED and energy recognition might not be satisfactorily resolved as a result of the present hearing. Under those circumstances, Hydro suggested that de facto energy recognition exists between NP and IC, and that undue weight should not be given to the effect on Hydro Rural classes because any additional deficiency resulting from application of the AED method would be allocated to NP and IC in the form of revenue deficiency charges.

Hydro's suggested resolution of the problem of energy recognition would be equitable only so long as the rates of Rural classes are totally independent of allocated cost. If at some future time the rates of Rural classes were to be set on allocated cost, or even on a stated fraction thereof, the proposed approach would be inequitable. The Board is not prepared to recommend a cost of service methodology unless it is inherently fair to all classes of customers.

The practical choices of allocation method are restricted to the AED or CP methods. The Board's consultant testified that the AED method is preferable from the standpoint of diversity benefits and user-pay charges. Hydro argued that user-pay charges are equitable. However, IC submits that there is little diversity in the system. The Board agrees that this is correct, and in view of the preponderance of NP loads is likely to continue to be the case in the foreseeable future.

The Board further notes from Exhibit GCB-6 that under an AED allocation the charge for non-coincident demand would be $80.69 per kilowatt-year, compared to a charge of $86.57 per kilowatt-year for average demand. Average demand bears full causal responsibility for demand costs, while non-coincident demand, which arises from off-peak use, bears none. The $80.69 is therefore a user-pay charge. The Board considers it inequitable to allocate almost as much for a kilowatt of demand which bears no causal responsibility for system costs as for a kilowatt which does incur that responsibility.

A further point cited by Hydro is that the AED method would temper the apparent over-classification of thermal plant to demand. In the absence of any quantification from Hydro of the amount of tempering to be provided through AED allocation, the Board cannot give any weight to this consideration; the same result could be unambiguously achieved through a CP allocation coupled with an appropriate classification.

Dr. Sarikas testified that he had recommended the AED method in part because it had regulatory acceptance in Newfoundland. This is true and it is a material consideration. Changes of methodology are likely to result in abrupt and somewhat arbitrary changes in the costs allocated to rate classes. In the interests of rate stability, it follows that methodological changes should only be made for good reason. However, in the present instance, Hydro is asking the Board to recommend far-reaching changes in methodology which would have a significant impact on allocated costs. Under these circumstances, retention of the AED method would not contribute to rate stability.

Further, Hydro has not explained why it proposes to retain the AED method for generation, and at the same time proposes to use the CP method for transmission.

NP recommended CP allocation, and IC recommended CP allocation unless generation fixed costs were classified 100% to demand. Mr. Brockman and the Board's consultant testified that CP demand best reflects cost causation.

After giving due consideration to all of the foregoing, the Board is of the pinion that a CP allocator would be preferable. It would provide an unequivocal basis for selection of an appropriate method of classifying generation demand costs. If the AED method were retained, the question of classification could only be resolved by reliance on unquantified phrases such as "energy recognition", or "energy weighting", which appear to the Board to entail different degrees for different classes.

Recommendation 7:

That generation demand costs be allocated to the Island Interconnected System using a coincident peak allocator.

The foregoing recommendation requires resolution of a further question at issue between the parties. NP recommends a 5 CP allocator and IC a 1 CP allocator. Hydro has proposed a 1 CP allocator for transmission.

The Board accepts Mr. Brockman's testimony that a 5 CP allocator provides a better measure of loss-of-load probability than a 1 CP allocator. However, it is the Board's understanding that loss-of-load probability considerations affect only the size of reserve necessary to provide reasonably reliable service; that coincident peak demand of the rate classes determines the generation necessary to meet the system peak, and that the reserve requirement is a relatively small part of total generation.

Nothing in the evidence enables the Board to quantify the relationship between system load factor and reserve requirements and in the absence of such information it is not possible to decide whether cost causation would best be measured by 1 CP, 5 CP or some other number of peaks. However, it appears that 1 CP correlates best with a major part of the costs.

The Board recognizes that under a multiple peak allocator, class demands not necessarily coincident with the system annual peak would incur some allocated cost, which would in effect be a user-pay charge. A 1 CP allocation would entail no user-pay charge whatsoever. From this point of view, the Board considers that a multiple peak allocator could be preferable, depending on the level of user-pay charges resulting therefrom.

On the other hand, the Board is aware that estimates of Hydro Rural class demands entail extensive analytical work, which raises questions as to the administrative feasibility of a multiple peaker allocator.

Recommendation 8:

That a 1 CP allocator be approved for interim use in the Island Interconnected System and that Hydro present to the Board at the time of its next rate hearing an analysis of the relationship between load factor and system reserve requirement, together with a recommendation regarding the number of peaks on which the CP allocator for generation demand costs should be based.

CLASSIFICATION OF GENERATING PLANT

Hydro's system includes both hydraulic and thermal generation. The proposed methodology differs between the two cases.

Hydraulic Generation

Dr. Sarikas' proposed method of classifying hydraulic generation is the "category of plant" method; also referred to in Mr. Baker's testimony as the "specific facilities" method. The method relies on a determination of the purpose served by each plant component, which in turn reflects the causation of the investment. Under this method, Hydro attributed the investment in dams, water-regulating structures, spillways and canals to energy and all other plant investment to demand. The overall result was to classify 56.4% of plant costs as demand-related and 43.6% as energy-related (Sarikas' Prefiled, P. 9 & 12).

Mr. Brockman proposed the equivalent peaker method of classification. This method assumes that demand without much associated energy can be most economically met by gas turbines. Therefore the capital cost of gas turbine capacity is taken as a proxy for the demand-related portion of plant cost and the balance of cost is attributed to energy. He proposed this method for the classification of all generation; thermal as well as hydraulic. For hydraulic generation, the result would be 26% demand, 74% energy (NP Final Argument, P. 5). (This method is detailed further beginning on Page 29 of this Report).

Dr. Olsen suggested that the split should be determined as the ratio of average monthly dependable capacity to total capacity, based on average river flow. This would result in a classification of 97% demand, 3% energy. (Prefiled, P. 8).

The Board's consultant presented the results of various analytical approaches including the equivalent peaker, peaker credit and plant factor methods. These methods produced an energy percentage varying between about 43% and 82%. He testified that the specific facilities method, if applied in a stereotyped fashion as Hydro had done, was not a good analytical approach.

In support of its proposed treatment Hydro's submission was that Dr. Sarikas' testimony had disclosed a full knowledge of the hydraulic system; a common thread through the testimony is the need for the analyst to consider all relevant factors and Dr. Sarikas had done this, and that his opinion should be given considerable weight because of his experience and knowledge.

Hydro further submitted that Mr. Baker's determination of an appropriate split was close to that of Dr. Sarikas; that he had not singled out another method which would provide a more reliable result; and that the differences between Dr. Sarikas' position and Mr. Baker's thus appeared to be philosophic and did not deserve undue weight.

In its submission, NP supported classification by the equivalent peaker method as being, in comparison to other methods advocated, the best approach to basing cost responsibility on causation.

The IC submission recommended approval of Hydro's classification providing a coincident peak (CP) allocator is used. Failing that, to avoid double-counting of energy through both classification and allocation, IC recommended a 100% demand classification. (Prefiled, P. 9).

In support of these recommendations, IC argued that Dr. Sarikas' approach (the specific facilities method) is used by BC Hydro; that the degree of cost analysis is illustrated by GCB-4, NP-11 and NP-42; that the method is simple, direct, rational, reflects engineering reality and cost causality. The IC argument further supported Hydro's characterization of Dr. Sarikas' demonstrated experience and knowledge and asserted that Dr. Sarikas' approach was not stereotyping. IC expressed a belief that further analysis of dam and reservoir capacity would result in additional classification to demand (admitted by Dr. Sarikas on cross-examination).

With regard to classification in general, IC submitted that:

(a) Costs are incurred for reasons other than to meet demand or energy requirements; social costs or policy objectives being examples;

(b) Methodology must be carefully selected, based on analysis, and reflect fairness and efficiency objectives; and

(c) The methodology should reflect adequate allocation of costs to demand; particularly as GCB-27 shows that the system will face demand insufficiency before energy insufficiency.

Thermal Plant

The Island Interconnected thermal plant consists of the Holyrood Generating Station, two gas turbines and a minor amount of diesel capacity. With respect to the gas turbines and diesel supply peaking and reserve capacity, Hydro proposed classifying them 100% to demand, and this was accepted by all parties. Differences of opinion arose concerning Holyrood, an oil-fired base load plant.

Dr. Sarikas proposed classifying costs of base load generation as 100% demand, except for fuel costs, which would be classified 100% to energy, relying on an AED allocation to provide energy recognition (prefiled, p. 11).

Hydro supported this treatment in its submission, arguing that it is difficult to separate classification from allocation; that the AED method used by Dr. Sarikas, plus classification of all fuel to energy, would temper this apparent over-classification and give an appropriate result. Hydro further called attention to two points in Mr. Baker's prefiled evidence: (a) demand insufficiency is expected to precede energy insufficiency, and (b) Hydro expects the system load factor to decrease.

NP's position and argument are the same for thermal as set out previously for hydraulic plant. The resulting classification for thermal is 49.9% demand, 50.1% energy.

The IC's submission supported Hydro's proposal, arguing that both Dr. Sarikas and Dr. Olsen consider it sound; that even if wide variations due to assumptions could be overcome, the peaker method would classify social and other costs to energy; that Mr. Baker could not find an empirical method to substantiate his claim that 100% demand was too much; that the Board should rely on a sound method; not on undocumented beliefs and feelings.

The Equivalent Peaker Method

Mr. Brockman recommended the Equivalent Peaker (EP) method as the soundest approach available to Hydro for classifying its hydraulic plants between demand and energy.

He stated this method uses the principle of causality to determine how much extra investment was made to construct hydro plants to save on energy costs rather than simply investing in inexpensive gas (combustion) turbines. The cost of a gas turbine (GT) that could have been built to serve short duration demands is used to determine the demand portion of the cost of each plant. The balance of cost is then taken as the amount that was spent to save on energy costs. This portion is classified as energy cost.

Mr. Brockman testified that the goal of assigning costs to the factors that caused them is best satisfied by the EP method. He suggested that Hydro clearly built many of the hydraulic plants on its system to save on energy costs, and that Hydro's own annual reports point this out in several places. For example:

> "The 120 megawatt hydro-electric development at Cat Arm has a high capital cost of $259 million compared to a 150 megawatt thermal alternative, which costs less than $100 million. However, the subsequent open-ended commitment for oil purchases is highly undesirable." (1979 Annual Report)

By these numbers alone, Mr. Brockman calculated that the money spent at Cat Arm for energy considerations was at least 159/259 or 61% of the plant cost.

Hydro submitted that the EP method should not be used in Newfoundland; IC supported Hydro's position and the matter was argued at length. The salient points may be summarized as follows:

(1) Discrepancy between escalated and planning cost

Mr. Brockman used the escalated cost of existing gas turbine capacity ($355) in his analysis. Hydro's planning cost for new gas turbines is $939 (in 1990 dollars). Hydro argued that the discrepancy shows the EP method to be potentially inaccurate. The fact that Statistics Canada indices are neither regional nor specific for plant types was suggested to be one reason for inaccuracy.

NP submitted that Hydro had not shown its current estimates to be reasonable, and that in any event what is important is the ratio of gas turbine cost to the cost of the other plant types. NP further argued that LLB-3 and LLB-4 (Transcript, pp. 367-369) show that escalators have little effect on the results and confirm the accuracy of Mr. Brockman's analysis.

In rebuttal, Hydro stated it had supplied its estimates in GCB-4 and NP-14; that no Intervenor had asked for further support of that figure; and that no Intervenor had filed an engineering estimate of current gas turbine cost. Hydro conceded that comparisons between historic and current cost are not directly relevant, but argued that escalators are intended to permit such comparisons. If escalators cannot achieve that purpose, Hydro submits they should not be used as the basis of classification.

(2) Failure to reflect miscellaneous cost factors

Hydro argued that costs incurred to attain enhanced reliability would, under the EP method, be classified to energy, whereas they should be classified to demand.

IC used a garbage can analogy to stress that the EP method would include cost of meeting social, policy and other objectives as energy-related.

NP submitted that Mr. Brockman did not agree with the analogy (Transcript, p. 267) and testified that if costs were incurred to attract industry with high load factors, then the energy classification would be appropriate (Transcript, p. 266)

(3) The EP method is a marginal cost approach

Hydro argued that the EP method imports a marginal cost concept into an embedded cost study. NP cited Brockman (Transcript, p. 231, 232) and Baker (Transcript, p. 491), both testifying that it was not a marginal cost concept.

(4) Potential error due to planning inaccuracies

Hydro submitted that the EP method presupposes exact knowledge of past planning decisions and is thus potentially in error due to errors in forecasting loads, fuel prices, etc.

NP argues that this criticism assumes past planning was wrong. Mr. Brockman (Transcript, p. 268) points out there is no reason for such a supposition.

(5) Anomalous results

Hydro argued that the large difference between the values proposed by Mr. Brockman and those resulting from other methods should in itself be sufficient cause for rejection of the EP method.

In its submission NP pointed out that results for thermal generation fall within the range considered appropriate by Mr. Baker (NP Argument, P.8).

IC submitted that results of the EP method were unreasonable: that the imputed energy costs for hydro were far larger than the cost of thermal energy. Therefore, the method could only be correct if Hydro had not made least cost investment decisions.

(6) Historic limitations

IC argued that at the time of investment decisions in Bay D'Espoir and Holyrood, gas turbines were not an alternative. NP submitted that in fact Hydro installed its first gas turbine in 1968 (NP Argument, P. 14).

(7) No Canadian precedent

IC pointed out that no Canadian jurisdiction uses the EP method.

Discussion

The methods proposed or considered during the hearing range from the fixed/variable (100% demand) classification advocated by IC for use with an AED allocator to the Equivalent Peaker method advocated by NP. They include the category of plant method proposed by Hydro for hydraulic generation, and the peaker credit, plant factor and system load factor approaches considered by the Board's consultant.

The Equivalent Peaker method was challenged in a number of ways, which in the Board's opinion focus on two critical aspects; the value to be assigned to the peaker used as a proxy for investment in capacity, and the degree to which economic assumptions affecting past planning decisions would have to be rediscovered and incorporated in the method in order to reach reasonable and equitable conclusions.

On the first of the above aspects, the Board is inclined to the view that costs of gas turbines of approximately the same vintage as other major plant acquisitions are likely to be more trustworthy than present-day costs and that Mr. Brockman's approach is not necessarily invalid by reason of using escalated historic cost.

As IC has pointed out, Mr. Brockman's analysis leads to imputed energy costs much higher than present-day costs of thermal production. The Board recalls that in the 1970's and early 1980's, dramatic and permanent increases in the price of oil were expected. Planners in those days could very well have justified a larger portion of plant investment on the basis of fuel savings than would now be considered prudent.

However, such a conclusion would not necessarily make it equitable for electricity users in 1993 to pay for energy what planners one or two decades earlier thought it would cost to produce energy in 1993. From this the Board concludes that it would in fact be necessary to identify and deal with the effects of past planning assumptions in order to obtain reasonable results from the equivalent peaker method.

Mr. Brockman accepted this view and made some adjustments in his calculations. The Board's consultant made projections based on a range of assumptions. These raised the demand component of classification to the 40% to 50% range.

The Board is of the opinion that with adjustments of this type the equivalent peaker method gives reasonable results. However, the scope of adjustment required would be to a large extent judgemental, so that within a range of values the classification obtained by the equivalent peaker method would in effect be arbitrary. For this reason, the Board will consider the method as providing a useful indication, but rejects it as a method to be used for the sole determination of the demand/energy split.

The category of plant (or specific facilities) method was proposed by Hydro and criticized by the Board's consultant on the ground that a stereotyped approach would not produce a reasonable result. Hydro submitted that from the testimony of Dr. Sarikas (transcript, pp. 72-74, 98-104), it is clear that he was fully cognizant with the nature of Hydro's system and there is no reason for concern about how the method has been applied. NP submitted that the approach was in fact stereotyped. Having examined the transcript and relevant exhibits, the Board finds that the approach was stereotyped; that, for example, a dollar of investment in a dam was counted as a dollar of investment in energy, regardless of plant identity, capacity factor, hydraulic regime or other characteristics. While not necessarily justifying rejection of this method, the Board is not confident of its sole suitability as a basis for classification.

The plant factor method considered by the Board's consultant attracted little attention during the hearing. Mr. Baker criticized it as being too weighted toward demand. The Board views this method also as an indicator but does not regard it as a suitable basis for classification.

The Board views the hydraulic and thermal generation in Hydro's system as parts of a unified approach to serving customer loads at least cost, but with somewhat different roles imposed by considerations of operational efficiency. The hydraulic plants are the dominant source of energy while Holyrood is the marginal source. Both contribute to meeting system demands, while the gas turbines occupy a reserve role.

It therefore appears that the respective roles of hydraulic and thermal plants are susceptible to gradual change. For example, growth of the system energy requirement would necessarily be met by increased generation from Holyrood, and in the course of time would probably result in a base load role for the plant. The generation system is dynamic and the initial planning reasons for plant may not match the reasons for its use many years later when the system has been modified.

Re-examination of cost of service methodology has been an infrequent occurrence in Newfoundland and in anticipation that this may hold in the future as in the past, the Board is concerned that the methods of classification will reflect changes in load patterns and use of generating facilities. Neither the equivalent peaker nor the specific facilities method have this ability, since both rely totally on past investment decisions.

The Board therefore finds it necessary to consider classification methods based on operating parameters; namely, system load factor and plant capacity factors. Such classification methods would be more flexible with the dynamic nature of the system.

The system load factor is the ratio of average demand to peak demand, and average demand is the amount of capacity required to supply the system energy requirement under ideal conditions; i.e., constant demand throughout the year. It is therefore logical to regard the system load factor as the fraction of plant investment necessarily incurred to meet the energy requirement and to classify this portion as energy-related.

This criterion would classify approximately 44.4% of hydraulic plant costs to demand. This compares to 56.4%, less any energy recognition conferred by the AED allocator, under Hydro's proposal.

Because Holyrood is the marginal energy producer and operates at a relatively low annual capacity factor, the load factor split would be inappropriate for that plant and should be restricted to the hydraulic plants. For Holyrood, an equitable basis for classification would be the annual capacity factor (or plant factor). To minimize temporary fluctuations due to variations in run-off, the capacity factor should be an average taken over several years. The Board believes a five-year moving average would minimize fluctuations without unduly delaying response to changes in system energy requirements.

A capacity factor split applied to Holyrood investment would result in a classification of approximately 66% to demand. Hydro had proposed 100% to demand less any energy recognition conferred by the AED method.

All parties agreed that a 100% demand classification would be suitable for gas turbine and diesel plant. The Board concurs.

If the above methods of classification were adopted, the resulting classifications would respond to changes in customer use of the system. A decreasing load factor would shift more classified cost to demand, and vice versa. Increasing energy requirements would result in more of Holyrood's costs being charged to energy use. Prior to the last Hydro hearing, Hydro used capacity factors of individual plants. The above methods are consistent with Newfoundland's past regulatory practice.

The Board is of the opinion that classification of generation by these methods would remain appropriate in the face of changing conditions and provide an accurate basis for rate design.

Having considered all the proposed alternatives, the Board is of the opinion that this method is preferable and will result in an allocation of fixed cost which is just and fair for all rate classes.

Recommendation 9:

That a proportion of hydraulic plant costs in the Island Interconnected System equal to the annual system coincident load factor be classified as energy-related and the balance be classified as demand-related.

Recommendation 10:

That a proportion of Holyrood generating station plant costs equal to the average of the plant capacity factor in the preceding five years be classified as energy-related and the balance be classified as demand-related.

Recommendation 11:

That all plant costs relating to gas turbine and diesel generation in the Island Interconnected System be classified as demand-related.

CLASSIFICATION OF FUEL AND VARIABLE OPERATING COSTS

Hydro proposes to classify fuel costs to energy and to classify all operating costs in the same proportions as plant costs.

NP recommended that gas turbine fuel should be classified to demand and that all other fuels should be classified to energy. NP further agreed with Mr. Baker that variable operating costs should be classified to energy (NP Argument, P. 7 & 8), (Brockman prefiled p. 26).

While the Board considers that the dollar amounts involved in the adjustments recommended by NP are relatively minor, it is of the opinion that the said adjustments would more adequately reflect cost causation in the system.

The Board notes that under its recommendation 11, diesel plant costs in the Island Interconnected system would be classified in conformity with gas turbines, and considers that for the sake of consistency the same conformity should be maintained in relation to fuel costs.

Recommendation 12:

That costs of gas turbine and diesel fuel in the Island Interconnected System be classified to demand and that variable operating costs and all other fuel costs be classified to energy.

ALLOCATION OF ENERGY COSTS

Hydro proposed to allocate annual energy costs in proportion to class annual energy use.

IC argued that this treatment involves a bias against high load factor customers (IC Argument, P. 44-47). In particular, IC contended that fuel costs vary with time, being highest at periods of high load; that in high load periods NP load is high and in low periods it is low, while industrial load is relatively constant throughout the year; and that allocation of fuel costs on total consumption thus understates NP responsibility and overstates Industrial. IC further submitted that losses are also highest on peak and the foregoing argument therefore also applies to losses. IC held that these biases could be corrected by time-of-use costing.

NP agreed with the IC position, and conceded that hourly allocation would be most accurate, but proposed monthly allocation as a more practical compromise. Monthly costing was said to understate NP fuel costs by no more than $2,000,000 (Dr. Olsen, Transcript, P. 417).

The Board notes that when the IC view with respect to generating costs was put to Dr. Sarikas and Mr. Bellin on cross-examination they pointed out that the facts were susceptible to an entirely different interpretation. Dr. Sarikas testified that Holyrood supplies the balance of system energy (Transcript, P. 123), and that the IC view is an incremental view which "infers that the base load of Hydro would be there first and would be for the benefit of the high load factor customer" (Transcript, P. 129).

Under the circumstance that Holyrood energy is needed to meet the system energy requirement, it is clear that if class energy use remained unchanged, but NP's load factor were such that the system did not peak in winter, system energy costs would remain unchanged. It is therefore unfair to assume that because of the peaky nature of NP's load it should be preferentially charged for the costs of thermal generation. The Board therefore concludes that allocation of average energy costs is equitable.

The situation is somewhat different with respect to losses, which occur as a consequence of the demands placed on the system. Peak losses are considerably higher than average losses and NP is largely responsible for the peakiness of the system load. The Board considers that it would be equitable to attribute energy losses to the various classes on a time-differentiated basis. The practicality of doing so has not been examined.

Recommendation 13:

That Hydro's proposed method of allocating energy costs be approved.

Recommendation 14:

That Hydro examine the practicality of attributing system energy losses to rate classes on a time-differentiated basis and report its conclusions as to both practicability and impact on allocated costs at the time of its next rate referral.

CLASSIFICATION OF TRANSMISSION PLANT

Hydro proposed that all transmission line and substation cost be classified 100% to demand, based on Dr. Sarikas' testimony that this best reflected cost causation. IC agreed completely with Hydro's approach.

NP recommended a 50/50 classification of lines and a 100% demand classification of terminals, resulting in an overall split of 67% demand, 33% energy.

Mr. Baker testified that it would be appropriate to classify lines built and still used primarily to connect generation to the system on the same basis as the generation. He further suggested that lines built to connect up isolated systems, where the justification was to avoid the high cost of local generation, would appropriately be classified partly to energy if not specifically assigned.

Hydro argued that Mr. Brockman's proposed split, and Mr. Baker's opinion that there should be some energy component, were arbitrary; that the Baker opinion that some lines were built to reduce energy cost was not shared by Mr. Brockman (an assertion refuted by NP) and that Dr. Sarikas' testimony shows Hydro's system is very different from the Manitoba Hydro system mentioned in Mr. Baker's testimony. Hydro concluded that Dr. Sarikas' approach is based on sound principles, is most reasonable and should be accepted.

The IC submission supported Hydro's argument and in addition pointed out that nearly all Canadian utilities classify transmission as demand related, and that where exceptions exist the reasons are clear (IC Argument, P. 25).

NP conceded that its position was arbitrary but submitted that this was due to difficulty in finding a strictly causal basis for classification (NP Argument, P. 16 & 17).

The Board accepts Dr. Sarikas' position that transmission line costs correlate almost completely with their capacity and therefore are attributable to the demands placed on them. This would certainly justify a 100% demand classification for lines performing a general transmission function.

However, the testimony shows that lines performing special functions have in other jurisdictions been deemed to warrant some degree of energy classification. The Board must therefore consider under what particular circumstances, if any, transmission lines might properly be classified partly to energy in Newfoundland.

It is a fair presumption that Hydro developed hydraulic sites because they offered capacity and energy at least cost, and that where such sites were remote from the transmission system, the cost of transmission between the site and the grid was included in the economic evaluation. Under such circumstances it is the Board's opinion that the transmission from site to grid should be classified in accordance with the generation itself. The response to GCB-11 shows that a number of lines were built for such purposes.

However, growth of the system and expansion of the transmission grid would have resulted in a change of role for many such lines. Where a line was built to access remote generation, but subsequently became a part of the main grid, it is the Board's view that any case for classifying part of the cost to energy would be extinguished.

In its submission, Hydro made the point that its system is quite different in character than that of Manitoba Hydro, which was cited as an example in Mr. Baker's testimony. The Board agrees that this is true in a general sense, but considers it a generalization which may well overlook the roles of lines connecting Cat Arm to Deer Lake, Hinds Lake to Howley, or Upper Salmon to Bay D'Espoir.

The Board notes that in Hydro's cost of service study, a part of the plant functionalized as transmission and classified 100% to demand has in RAB-1, Schedule 2.2A at lines 12 and 13 been charged to production demand. In the Board's opinion all lines, terminal stations and ancillary equipment dedicated to the service of a generating station should be classified in conformity therewith.

Recommendation 15:

That transmission lines and substations in the Island Interconnected System used solely or dominantly for the purpose of connecting remotely-located generation to the main transmission system be classified in the same manner as the generating stations they serve.

Recommendation 16:

That all other transmission be classified 100% to demand.

The other circumstance cited in the testimony involved lines built to connect previously isolated areas to the system, where part of the justification was to avoid the high cost of local generation. In principle, the Board is inclined to the view that some energy component would exist. In practice, it would in the Board's opinion be very difficult to determine to what degree construction was justified by prospective energy savings and that even if such information could be obtained, the results would probably be anomalous because of differences between forecast and present-day fuel prices.

The Board is therefore of the opinion that it would be approximately correct and administratively prudent simply to classify sub-transmission consistently with that of the rest of the system.

Recommendation 17:

That sub-transmission be classified in the same manner as recommended in Recommendations 15 and 16.

ALLOCATION OF TRANSMISSION COSTS

Hydro proposed allocation of transmission costs on a single coincident peak allocator and justified this treatment on the ground that the costs correlate with peak demand as well as on Dr. Sarikas' testimony that the CP method "attains greater adherence" to demand side management (DSM) considerations.

NP recommended allocation of demand costs on a 5 CP allocator and energy plus losses as the allocator for energy-related costs. In support, NP cited Mr. Baker's preference for a multiple peak allocator (Transcript, p 484).

NP's recommendation was opposed by both Hydro and IC. Hydro argued that the highest peak determines the cost to the system and that 5 CP merely dilutes the responsibility for that peak. IC argued that the 5 CP allocator would lower the cost to NP and this is unfair to IC, whose combined demand is relatively stable throughout the year.

NP's justification for a 5 CP allocator of generation demand was that it would reflect responsibility for loss of load probability (LOLP) better than a 1 CP allocator. In the Board's opinion, this argument had some relevance for generation, because the reserve requirement is related to LOLP.

Transmission costs are on the other hand not influenced by the generation reserve requirement and the same considerations would not apply.

The Board understands that the usual reason for choosing a multiple peak allocator is to smooth out random variations in peak responsibility. In Newfoundland, because of the dominance of NP's load, there is very little diversity and for this reason random variations from peak to peak are relatively minor.

In consequence, the Board is of the opinion that no justification exists for a multiple peak allocator in the case of transmission costs.

Recommendation 18:

That transmission and sub-transmission costs in the Island Interconnected System be allocated by means of a 1 CP allocator.

CLASSIFICATION AND ALLOCATION OF DISTRIBUTION COSTS

Mr. Bellin proposed that Hydro's distribution costs be classified in accordance with the zero intercept method.

The approach was criticized by Mr. Baker on the grounds that both mainstream methods are biased and result in too high a percentage of customer costs; that a large proportion of transformer cost had been classified as customer and that the zero intercept method had been incorrectly applied in the case of poles.

Hydro submitted that the demand/customer split proposed by Mr. Bellin should be accepted because his method has wide regulatory acceptance; and also because Mr. Baker agrees with the results obtained, and concedes that the matter does not have great impact on cost sharing between classes.

The Board accepts Hydro's opinion that the methodology used does not have great impact on cost sharing between classes. However, it does not agree that the method employed by Mr. Bellin to obtain the zero intercept cost of poles has wide regulatory acceptance and it is reluctant to recommend methodology for long-term use which is logically inconsistent.

Recommendation 19:

That Hydro's proposed classification of distribution costs be accepted for interim use and that Hydro prepare a revised study of distribution cost for presentation to the Board at the time of its next rate referral.

Allocation of distribution demand costs

Hydro proposed to use a 1 CP allocator to allocate distribution demand costs. NP and IC agreed with Hydro's proposal.

In consideration of the circumstances the Board agrees that Hydro's proposed method is appropriate.

Recommendation 20:

That Hydro's method of allocating distribution cost be approved.

LABRADOR INTERCONNECTED AND ISOLATED RURAL SYSTEMS

The issues raised at the hearing with respect to the classification and allocation of functionalized cost focused on the Island Interconnected System. The Board's discussion and recommendations presented in prior sections of this report necessarily have the same focus. In this section the Board considers the extent to which its recommendations are suitable for the Labrador Interconnected and Isolated Rural systems.

The generation sources in Labrador Interconnected and Isolated Rural Systems differ from those in the Island Interconnected System. The Labrador Interconnected System is supplied from Churchill Falls under a take-or-pay contract. The contract does not provide separate prices for demand and energy. Isolated Systems are supplied by local generation, predominantly diesel.

The importance of energy recognition in the Island Interconnected System arises because load factor influences choice of generation type and therefore influences generation cost; a point on which expert testimony was unanimous. By contrast, in both the Labrador Interconnected and Isolated Rural Systems, no realistic generation options exist. Therefore, the reason for classifying a part of generation fixed cost to energy in the Island Interconnected System does not appear to the Board to be relevant in the other two systems.

The Labrador System also differs from the Island System in terms of the diversity which exists. In the Island System, the NP load is dominant and non-coincident excess demand comprises only about 3.6% of total demand. In the Labrador System, no single class is so dominant, and the comparative figure is 10.1%. Therefore, in the Board's opinion there is some reason to prefer the AED method.

Because of the foregoing considerations, the Board is of the opinion that Hydro's proposed methodology will fairly reflect causal responsibility for costs in the Labrador Interconnected and Isolated Rural Systems.

Recommendation 21

That subject to the provisions of Recommendation 19, Hydro's proposed methodology be approved for the Labrador Interconnected and Rural Isolated Systems.

MOBILE GAS TURBINE OWNED BY NP

Hydro's cost of service study does not provide credit for the capacity of NP's mobile gas turbine at Port aux Basques. Hydro submits that the evidence from the last hearing indicated the mobile unit had been connected at Port aux Basques for the majority of the time in recent years but is in fact a portable generator and has been connected in other areas when they have been isolated from the main grid. Hydro's position is that as a portable generator it cannot be relied on by Hydro as firm generation and NP should therefore receive no credit for its capacity.

NP argues that as the unavailability of this gas turbine is of the same order as that of other generation plant which Hydro does include in its system capacity, it would be appropriate to include the mobile gas turbine as part of NP's gross generation before adjusting for reserve capacity in the cost of service study.

The relevant question arising from these submissions is whether or not NP's mobile gas turbine has an availability commensurate with units Hydro does count as firm capacity. The Board notes Dr. Sarikas' testimony that Holyrood units are down for maintenance for 4 to 4.5 weeks per year (Transcript, p. 123) and further notes NP's testimony at the previous hearing which indicated the mobile turbine is connected at Port aux Basques except when required for emergency duty. When employed in such duty, it appears to the Board that the mobile turbine is actually supporting load which Hydro would normally supply. Thus, the unavailability of the mobile turbine would be limited to the transit time from Port aux Basques and back again. The Board concludes that the unit should be included by Hydro as a part of system capacity.

Recommendation 22

That for cost of service purposes Hydro include the NP mobile gas turbine as part of NP's gross generation before adjusting for reserve capacity.

DEFICIT OF HYDRO RURAL

Unlike previous topics, the allocation of the Hydro Rural Deficit is not as easy to assess according to its functionalization and classification. The deficit instead falls out of the operation of a system that is physically, for the most part, and financially isolated from the three main classes in the Cost of Service, NP, the Industrials and Labrador Interconnected.

The background of the deficit has been described and recounted in many reports in the past. In summary, the Government had isolated the majority of what is now Hydro Rural in an organization called PDD. The systems developed in the PDD areas were free of many of the economic constraints in other electrical utilities, and no doubt were designed to fulfil valid social and political objectives. When the geographic locations, small size and cost of diesel generation are considered, it is no surprise the cost of service in the isolated systems far exceed the revenue generated.

In 1989 the Government of Newfoundland and Labrador decided that the annual government subsidy required to fund this Rural system would be phased out. However, funding from some source is required as revenues account for a very small portion of cost (approximately 30%). Therefore, Government had the PDD assets, liabilities and operations transfer by amalgamation to Newfoundland and Labrador Hydro Corporation, the EPCA was amended and provisions were made that the deficit from Hydro Rural would be funded by NP and the Industrial Customers. In 1991 the EPCA was again amended so that the allocation and funding of the deficit could come from NP, the Industrials, and the Labrador Interconnected customers.

This hearing was not to discuss the actual components of the deficit but the methodology on which it would be allocated to the various subsidizing classes. Nor does this hearing have the mandate to review revenues from Hydro Rural Customers.

The allocation of the Rural Deficit has been described loosely over the years as a tax. Point 21 of the Town's final argument states:

> "To the extent that Mr. Brockman's proposal on the rural deficit is tied to energy usage, it is in effect treating the deficit as a commodity tax. It is not competent for the Board to treat the rural deficit as such since the Provincial Legislature is constitutionally incapable of imposing this sort of tax. The Legislature is restricted to direct taxation within the Province and the commodity tax is the clearest possible example of an indirect tax. This was put beyond all doubt by the Privy Council in the famous constitutional law case in King v. Caledonia Colleries [1928] 3 DLR 657, which is still recognized as being accurate in law."

The argument is founded on descriptions of the allocation as a tax and a substitute for a tax. It has also been labelled as a profit or margin. First of all, as a component of a Cost of Service and basis for pricing under a cost recovery system, the allocation of rural deficit represents the allocation of another group of customers' cost of service. It requires the "subsidizing" customers to pay a rate that recovers their own cost of service, interest margin and a cross subsidy for the rural customers.

Witnesses since 1990 have all recognized electrical utilities have cross subsidization to some degree. A simple example is for customers on one street. The customer closest to the main line experiences the cheapest cost, the customer furtherest away experiences the highest cost of service. All customers pay the same rate based on the average cost. Therefore, to a small degree there is cross subsidization on every street.

There is no doubt the subsidization in question here is more extreme and we are not even dealing with customers using the same physical system. Mr. Baker has also pointed out its similarity to other cross subsidization is further eroded by the separate accounting for costs of rural customers as well.

However, the cost of isolated rural customers systems is still a cost to Hydro. Hydro is empowered to recover its costs and is clearly directed to do so under Section 4.1 of the EPCA.

The allocation of the Rural Deficit has been labelled a tax by many parties none of whom would be a qualified expert in taxation. The case cited by the Towns in defence of their argument was King v. Caledonia Colleries [1928] 3 DLR 657. The case cited deals with the competency of a province to assess an indirect tax. Hydro incurs the costs for the benefit of isolated customers and will pass on the costs directly to its customers including the customers of the Towns.

While the "passing on" of the Rural Deficit initially may appear similar to an indirect tax, the fact that it is levied by Newfoundland and Labrador Hydro on the customers of Labrador, would appear to make it more akin to a direct tax for the following reasons:

1. The "tax" is essentially levied on the final user - the consumer of hydro. As there is no ability for these consumers to sell the electricity, it should be considered a form of direct taxation.
2. Whether the allocation of the rural deficit is actually included in the rates charged to the consumers, or charged separately on the bill, should not change its character.

Furthermore, as precedents for competence to levy commodity tax by a province, the Board is aware of the levying of tobacco tax which is levied on the wholesaler and the tax is passed on to the retailer as part of the wholesale price of tobacco products. The same is true of gasoline tax. The Province also collects revenue by commodity sales of liquor and beer from its Crown Corporation, the Newfoundland Liquor Corporation.

Therefore, the Board concludes that Hydro has legislative authority to recover Hydro Rural Deficit under Section 4.1 of EPCA; there is no evidence that the recovery is in fact a tax at all, as cross subsidization is a fact in any utility; if the recovery was a tax, then it would be a direct tax on Hydro's customers including Labrador customers and within the Province's constitutional competency. There does not appear to be any competency constraint in the methodology chosen to allocate the rural deficit either by revenue to cost ratio of one, energy allocation or some combination of revenue, energy or demand.

Hydro proposes to allocate the Rural Deficit incurred in serving Rural Customers on the basis of their revenue requirement. Such a method results in the same revenue to cost ratio for all of Hydro's other customers regardless of whether they are served by the Island or Labrador Interconnected Grid. The allocation of the Deficit would be in accordance with dollars of revenue. Therefore it is possible for a ratepayer who consumes a large amount of energy at a low rate to pay the same as a customer who consumes a smaller amount of energy at a high rate.

NP has taken the position that there is no basis to be found on which non-rural ratepayers can have the deficit allocated in accordance with causality. In determining an allocation basis only fairness of the ultimate result can assist in its selection.

NP rejects Hydro's proposal on the grounds that it allocates the burden of the deficit unfairly, allowing Labrador Customers with low rates to receive a small share of the deficit burden. They also share the view of the Board's Consultant, that allocation by revenue requirement amounts to a value added tax.

NP rejects the proposal of the Industrial Customers with respect to allocation on the basis of plant cost since, this would allocate even less to Labrador as the Labrador Interconnected System does not have an investment in generating plant (this belongs to CFLCo.) . Also Plant Costs alone do not result in the Rural Subsidy. A significant portion of the deficit arises due to under-recovery of the variable fuel and operating and maintenance cost, i.e. every KW produced is produced at a loss before depreciation of plant. Therefore, it cannot be assumed that the deficit would be largely related to plant.

The proposal put forth by NP is that the deficit be allocated to customers on the basis of 50% energy and 50% revenue requirement. NP felt this fairly allocates the deficit, on which those subsidizing have no control, in a manner that allows for consumption as well as revenue.

The Town of Labrador and the Town of Wabush are both in agreement with Hydro's position and are opposed to the position of The Board's Consultant and the position of NP.

The Towns believe that allocation according to revenue requirement is in accordance with sound regulatory principles. However, they add the qualifier that a portion of the deficit must be allocated to the rural customers themselves. As pointed out above, such matters are not within the mandate of this hearing.

With respect to the allocation to Labrador Interconnected Customers, the Towns feel it is unfair to transfer a disproportionate increase in electricity costs without considering the serious implications of making life in Labrador more expensive. Certainly any transfer that is not fair in and of itself is discriminatory.

The Innu Nation has not taken a specific position on methodology matters.

The Industrial Customers submitted as argument the position that the allocation as presently structured has put an additional burden on their group of $711,913 on average with the highest allocation to an industrial customer of $1,908,618. This additional burden has placed a significant impact on the individual industrial customers who are unable to pass the cost on to their customers. The Industrial Customers' position is as follows:

> "There is an inherent unfairness in Hydro's present proposal with respect to recovery of the deficit. As Mr. Baker pointed out, Labrador interconnected customers have the benefit of cheap electricity. Thus, the revenue requirement per kilowatt hour and per kilowatt for electricity for Labrador Interconnected Customers is much lower than for Newfoundland Power and the Industrial Customers. To base the recovery of the deficit on revenue requirement therefore discriminates against Newfoundland Power and its customers and the Industrial Customers on the island portion of the province."

The Industrial Customers and its expert believe there is nothing inherently good about maintaining a revenue to cost ratio of 1. They also point out that if geography was an issue, at least half of the isolated systems are located in Labrador. Therefore, the submission of the Industrial Customers is that it is not equitable or just that the Labrador Interconnected Customers contribute less to the rural deficit simply because they have lower rates.

The Industrial Customers reject NP's proposal on this matter since it transfers burden from NP to the Industrials. Also the Industrials have taken the position that a large deficit allocation to NP is flowed through and split between many thousands of small customers. In IC's final argument, p. 38, it states:

> "However, for the most part, the relatively small adjustment to individual Newfoundland Power customers is absorbed by those customers and can be offset by adjustments to other parts of their budget."

The Industrial Customers feel that should the deficit be allocated according to revenue requirement, then revenues must be redefined so that all revenues in Labrador are calculated for this purpose using the same rates as classes on the island. However, their preferred position is that it be allocated on the basis of the plant cost assigned to each class. This would be very beneficial to the Industrial Customers, intended to be more costly to Labrador and also to NP. The impact on Labrador, they recommend be phased in, starting with 13% increase in rates which is presently the impact on the island since 1990.

In summary, there are four proposals set forth in argument for the allocation of the Deficit. The first proposal is Hydro's as applied for. The second is NP's proposal of 50% energy and 50% revenue requirement. The third and forth are proposals of the Industrial Customers, that the deficit be allocated according to plant costs associated with the three major customer classes and failing this that Hydro's revenue requirement allocation be modified so that the Labrador Interconnected revenue be recalculated using the island rates.

The Board agrees with the views of all parties that the allocation be based on fairness. The problem that arises here is that those being allocated the costs have not caused the costs and cannot use any mechanism in their own use of electricity to control them. Therefore an allocation method cannot be based on causality nor evaluated as fair on that basis. The Board is also concerned with the fairness to the individual customers of NP who will have this cost passed through to them once the amount is assigned to NP. We do not share the opinion that the allocation of the deficit has little effect on the individual customers of NP. The customers of NP on relative terms are very sensitive to changes in rates. This of course is equally true of Labrador Interconnected Customers and the Industrial Customers.

Throughout the hearing and as part of final argument fairness was often measured in terms of the impact a change makes. The Board prefers to assess the fairness of the allocation to all parties on its own merits and once this is determined the Board could then consider rate shock implications and the merit of phasing in the change at the time of a full rate hearing.

The Rural Deficit is created based on the electrical consumption of customers in rural areas, predominately isolated areas. There is little any of the subsidizing customers can do to affect (upwards or downwards) the level of this deficit. Consequently each customer's consumption pattern, load pattern or demand has no bearing on the deficit. Therefore as stated there is no cause and effect relationship upon which to fairly allocate the deficit. Justification cannot be found for allocation methods solely on the basis of demand, solely on the basis of energy or on some combination of both. Fairness cannot be assessed as due to the method used but instead we must assess fairness on the basis of the result, a shared burden among the classes of customers that is fair to all and not discriminatory.

Allocation on the basis of Plant Cost is acceptable to one party alone, the Industrial Customers. It is not the level of investment of plant in non rural areas that affects the rural deficit, nor would this measure ability to pay or the location of those who are asked to subsidize. NP has a convincing argument in pointing out that Labrador Interconnected would pay less than Hydro now proposes since they do not have a significant investment in generation plant, since plant used is accounted for in a separate legal entity, CFLCo., hence this method would do little to spread the burden of the deficit. The Board does not recommend this methodology.

Allocation on the basis of 50% energy and 50% revenue requirement is a modification of Hydro's proposal, acceptable to NP alone. It is a method that was recommended since NP felt the proposed method did not give sufficient weighting to customers consuming energy at a low rate and therefore with lower

revenue. It points out the concern the paying classes have for a level playing field where all parties are assessed on the same basis regardless of the rate they are paying. The three major classes are NP, the Industrial Customers and Labrador Interconnected, all of which do have different rates. Allocation according to revenue requirement would also give additional benefits to a party when one class has a rate reduction or a revenue benefit from DSM. When revenue is reduced in such manners, there is no corresponding reduction in rural customer cost, and unrecovered costs cannot be recovered in the subsequent periods.

The reverse could also happen if one class were to have a rate increase on the merit of their cost of service. This would immediately result in additional responsibility for the rural deficit.

The Board's expert witness pointed out that this method of allocation equates to a subsidy from Island Interconnected customers of $4.71 per MWh and about $1.94 per MWh from Labrador classes. Mr. Baker feels that to saddle certain classes with higher subsidy costs simply because they have higher rates to start with seems unfair. Dr. Sarikas took exception to this view as he feels Hydro's proposal has all customers paying the same percentage of revenue as subsidy. Of course it depends on how you look at it, as a percentage or as a rate per unit.

Hydro's proposed method of deficit allocation is not in accordance with generally accepted cost of service methodology since the cost bases of the subsidizing classes are not obtained in a uniform manner. NP and IC proposals also are not in accordance with generally accepted cost of service principles for the same reasons. In addition, NP and IC's proposals use arbitrary methods of allocation.

Mr. Baker has presented in his evidence a method of allocating the deficit on the basis of a mini cost of service. Such an allocation attempts to compensate for the inequities in the other methods proposed. The result of this approach is to increase unit costs equally in the two Interconnected Systems. However, Mr. Baker points out this method attempts to equalize the subsidy between the Island and Labrador. Since Labrador has not paid the subsidy in the past and has been adjusted in cost, for the purpose of this allocation only, Labrador's increase in costs is twice as large as for the Island. Matters relating to possible rate shock are best addressed in the context of a rate hearing. This report has been restricted to methodology only.

Recommendation 23

The Board recommends the approach illustrated in Exhibit GCB-5 (Appendix 1 of this Report) for the allocation of the rural deficit for the purpose of the cost of service.

THREE-PART RATE TO BE CHARGED NP BY HYDRO

Hydro and NP have informed the Board that their proposal for a three-part rate is not yet finalized. Hydro and NP are continuing to negotiate on this matter.

The Industrial Customers stated that although not significantly affected by the NP rate structure, a rate with demand charge would encourage DSM by NP; Industrial Customers therefore recommend Hydro and NP be ordered to submit a three-part rate for approval within a time limit set by the Board.

The Board will not recommend a time limit for submission of a proposed three-part rate.

RATE STABILIZATION PLAN (RSP) ADJUSTMENTS

Hydro presented the following provision to be included in the RSP so that it will be credited with the additional revenue received by Hydro as a result of NP's rate adjustments:

1. the additional revenue be calculated on a monthly basis;
2. the additional revenue be determined by rate class, using the individual components of each rate;
3. the additional revenue be calculated using the actual billings for each month less the revenue which would have resulted from rates in existence in the test year when the cost of service was approved;
4. this policy become effective with the next NP rate alteration, subsequent to the conclusion of this hearing; and
5. the policy apply to all alterations (increases and decreases) to NP rates that could result in a change in Hydro's rural revenues.

NP agrees with Hydro's proposal in theory as outlined by Mr. Sturge, however, Hydro should develop a mathematical equation with all variables defined, which explains how automatic adjustments are to be calculated. All similar adjustments made by NP are set out in its Rules & Regulations. This should also be Hydro's practice.

Recommendation 24:

Hydro's proposed provision be included in the RSP along with a mathematical equation with all variables defined, which explains how automatic adjustments are to be calculated. The provision should be included in Hydro's Rules and Regulations.

INTERRUPTIBLE POWER RATES

Hydro submitted that the contractual arrangements for the purchase of the right to interrupt power from some of its Industrial Customers have not been finalized and that there would be no cost impacts resulting from this until 1994. It is therefore not practicable to deal with this issue further in this hearing and it is submitted that the matter be deferred until such time that it can be dealt with more meaningfully.

NP recommends that at the time interruptible customers become a reality, the exact details of the impact on cost allocation among customer classes should be reviewed by the Board.

OTHER METHODOLOGICAL ASPECTS

A cost of service study involves a multitude of methodological details. The matters discussed in this report are for the most part matters of contention between the parties. Many details were not contested, either by reason of tacit acceptance or relative unimportance. The Board interprets the absence of contrary opinion as tacit acceptance and after review of all pertinent details finds the methodology appropriate, except as specifically indicated herein.

Recommendation 25:

That except where a different approach is specifically recommended in this report, Hydro's cost of service methodology be approved as submitted.

ADOPTION OF METHODOLOGICAL CHANGES

In its referral, Hydro sought permission to use the methodology approved in the Board's 1992 report until such time as it made its next rate referral.

The IC position was that if changes are needed to eliminate inequity, then delay is inequitable, and that the new methodology should be implemented effective January 1, 1993, "with rate changes as pass-throughs".

In its reply, Hydro interpreted the EPCA to provide that rates cannot be changed without a Referral or a Reference to the Board. Hydro also argued that the cost of service is one component of the RSP and that insofar as changes in the RSP constitute changes in rates, COS changes must also await a Referral or a Reference.

The Board accepts Hydro's view that implementation of changes from existing cost of service methodology would require a Referral or Reference. The question to be resolved therefore is whether the changes in impacts on rate classes are so significant as to justify an immediate referral.

Because this was a generic hearing, some of the Board's recommendations defined the principles to be followed, rather than specific percentages or amounts. Until Hydro applies those principles to determine the classified costs of service, the impacts on rate classes cannot be accurately determined. The Board estimates that the recommended changes in classification and allocation of generation costs and sharing of the Rural deficit will result in the following approximate increases or decreases of allocated cost, compared to Hydro's proposed methodology:

	$ Millions
Newfoundland Power	(2.8)
Island Industrial	.8
Labrador Industrial	.6
Labrador Interconnected	1.4.

Impacts due to other recommended changes including functionalization and classification of transmission would affect Island classes only and are not included in the above figures. They would in the Board's opinion be comparatively minor.

Insofar as the Island Interconnected classes are concerned, the Board's recommendations would tend to reduce the differences in allocated cost between Hydro's cost of service studies dated November 1991 and June 1992. The additional impacts due to the recommended methodology would therefore in the Board's opinion not justify the cost of a referral solely for the purpose of implementing it.

Recommendation 26:

That the cost of service methodology recommended herein be adopted by Hydro for the purpose of its next rate referral.

SUBMISSION OF ABITIBI

A SUMMARY

There is a severe world-wide over-capacity situation in the newsprint industry. World-wide it is a buyers market and in order to sell newsprint today, it is necessary to offer large discounts. In fact, newsprint prices have been falling for four consecutive years and are now at levels last experienced in the late 1970's.

When Mr. Verhoeven appeared before the Board in February of last year, he projected an operating loss of $3.5 million for 1992 for the Stephenville Division. Due to further erosion of newsprint prices, Abitibi is now projecting a loss of $10 million for 1992.

No change is expected in the economic outlook for the Stephenville Division in 1993 from 1992.

Power represents 23% of the Stephenville mills manufacturing costs. The mill purchased 480 gigawatt hours of electrical energy at a total cost of $19 million.

Abitibi continues to make a concerted effort to reduce operating costs at the mill.

While cost-cutting measures have not affected the quality of the product, Abitibi have had virtually no capital budget for the last several years and, with the kinds of losses experienced, that situation is not likely to improve. As a result Abitibi is working with some equipment that is beyond its expected work life. If this situation worsens or even if it continues as is there is bound to be a deterioration in its competitive position even vis a vis other Abitibi mills whose economic performance in these difficult times is allowing replacement and upgrading of capital plant.

Abitibi have been involved in a number of initiatives to try and reduce their power cost, both internally and externally. For example, they are actively pursuing Demand Side Management initiatives with Hydro, have had an energy audit of the plant, they purchase only high efficiency electrical motors, and are constantly working on improving Abitibi's daily load factor.

As a result of Abitibi's internal initiatives, 1991 saw three record achievements: production of 166,737 tonnes of paper, 86.1% absolute efficiency and 1010 meters per minute of paper production. These surpassed the records respectively set in 1985, 1988, and 1989. In June 1992 they set production records for: (1) most tonnes in a single month, and (2) highest absolute efficiency for a month. They produced 15,395 tonnes of newsprint, operating at a paper machine absolute efficiency of 90.2% ranking Stephenville 18th of 138 worldwide machines reporting to Canadian Pulp and Paper Association.

These hearings may affect the future of one or both of Abitibi's mills in the province. Since the Stephenville mill is totally dependent on electricity generated by Hydro, any decision which will increase the cost of power will affect the cost per ton of newsprint and, thus, the competitiveness of the mill. To the extent that the Grand Falls mill also purchases electricity from Hydro, its competitiveness may also be affected by the outcome of these hearings. At a time when Abitibi is streamlining its operations worldwide and is closing some mills, its competitiveness is extremely important. Any erosion in its cost per tonne could be catastrophic. This industry, like others in Newfoundland, needs all the cost saving measures possible in order to survive the current crisis in the newsprint markets.

Hydro is recommending changes to the cost of service methodology. The savings available to the Stephenville mill pursuant to the method proposed by Hydro is over $3 million per year which is a savings of 16% per year. In this terrible economic situation where Abitibi, Stephenville, is facing $10 million loss this year, paying this extra $3 million has a significant impact on the viability of the mill and in fact the paper industry in Newfoundland.

SUBMISSION OF THE INNU NATION

A SUMMARY

The Innu Nation were granted intervenor status on their request for this methodology hearing. The areas of interest did not in all instances specifically relate to methodology. These areas of interest include the following:

(a) Innu are seeking compensation for damages re flooding of the Churchill Falls Smallwood Reservoir. Hydro's rates should incorporate a provision for compensation, failing which a shortfall could occur if the Innu succeed.

(b) Hydro's rate structure will affect the likelihood that Hydro will need new generating capacity.

(c) Innu wanted to make the point that the proposed Lower Churchill site is on land never ceded or treatied and that development is risky.

(d) Innu sought disclosure of contract negotiations between Hydro and Quebec Hydro.

The Innu were concerned with the lack of intervenor funding, particularly that approval of funding prior to commencement of the Hearing was refused. This action was seen by the Innu as limiting their participation in the process. The Board had advised the Innu to work through the Consumer Advocate. However, this arrangement was seen to be unworkable. They identified a conflict between the Innu goals and the mandate of the Consumer Advocate to argue for least cost to consumers. The Innu see compensation for the flooding of Innu lands which would raise the price of electricity in the Innu's assessment as being contrary to the mandate of the Consumer Advocate.

The lack of advance intervenor funding and the conflict with the Consumer Advocate's role prevented the Innu from calling witnesses, cross-examining or otherwise participating except to receive transcripts and responses to Demands for Particulars.

On the basis of the information in demands for particulars and hearing transcripts, the Innu submitted final argument. The salient points of their submission are as follows.

Hydro provides nothing in its methodology to reflect costs on the Innu of existing dams and transmission lines. These include loss of hunting grounds, destroyed personal belongings, social and environmental impacts and competition with Hydro personnel for resources. There is no provision for allocating costs of compensation to consumers. There is no provision for costs on Innu caused by future expansion. There is no provision to cover risks of investing in large, distant generating stations with uncertain markets and land rights unsettled. Dr. Sarikas' testimony was criticized relating to zero energy costs of hydro generating, concluding that costs to the environment and the Innu have been "conveniently ignored". The Electrical Power Control Act (EPCA) is construed as

permitting such costs to be included in rates. The EPCA provides that Hydro is to maintain a sound credit rating. Thus the Board should ensure that all costs are included. None of the other intervenors' proposals would do anything to capture externalities. The Innu didn't have the funding to address the specifics of externalities. The Innu Nation submits the Board should direct Hydro to submit its plans at a hearing on least cost planning and Demand Side Management (DSM). Responses to Innu demands show the proposed cost of service methodology is weak from a DSM perspective. Successful DSM measures can defer or displace new generation. Success depends on program design and on costing and pricing methodologies. Responses indicated Hydro does not have a plan for incorporating DSM in the cost of service, does not have disaggregated end-use data bases for DSM design, and may make the cost of service methodology itself an obstacle to successful implementation of DSM.

The Innu detailed a long list of information Hydro did not supply. The list is all relevant to design of a DSM program. However, DSM program design has nothing to do with an embedded cost of service study which is devoted to the study of methodology and not of specific costs or future programs.

The Innu recommend a DSM hearing should be held within three months of filing of Hydro's first annual DSM report. Hydro, NP and Industrial Customers should be required to present and defend their programs. The hearing would ensure full review of opportunities to defer or eliminate new capacity before new commitments are made. Given the great importance DSM has acquired in almost every North American jurisdiction, it would be imprudent not to do a full review of the situation in Newfoundland.

The Innu further recommend the Board should develop a clear policy on intervenor funding. This new policy should be derived following public consultation. If the Board develops new guidelines or identifies other sources of funding, the Innu can participate effectively at the proposed hearings on DSM and Least Cost Planning. In the long run, this will protect consumers from poor planning decisions. Section 83 of the Public Utilities Act is cited as being relevant to this problem.

HYDRO'S RESPONSE TO THE SUBMISSION OF INNU NATION

A SUMMARY

Hydro responded to matters raised by the Innu in its rebuttal argument. With respect to including externalities in the embedded cost of service study, Hydro's position is that externalities, if they exist, have not been quantified. If externalities become actual liabilities of Hydro, which are quantifiable and related to provision of electrical service, then it might be proper to include them.

With respect to DSM, Hydro put forth the following position:

(a) DSM expenditures to date have not been material enough to warrant capitalization and have been expensed.

(b) When Hydro's DSM expenditures reach a level justifying capitalization, the issue raised by Innu will have some merit.

(c) Innu advocates DSM hearing. Hydro does not believe a hearing is needed. Matters can be dealt with in the normal course through rate referrals.

PART III - SUMMARY OF RECOMMENDATIONS

1. That Hydro's Cost of Service Study be of the embedded type and that the methodological objective be to allocate costs to rate classes in a fair and equitable manner based on causal responsibility for cost incurrence.

2. That the structure adopted by Hydro for cost of service purposes comprising one study for the Island Interconnected System, one for the Labrador Interconnected System and one for all Isolated Rural Systems be approved.

3. That the Howley-Cat Arm transmission line be treated as common.

4. That transmission lines dedicated to the service of Hydro Rural rate classes be included in a sub-transmission function, and the costs attributed thereto be allocated exclusively to such classes.

5. That the methodology indicated in Recommendation 4 be applied in the case of transmission serving both NP and IC but not the Rural classes, provided the costs total at least 2% of total transmission costs.

6. That with the exception of the plant affected by Recommendations 4 and 5, Hydro's method of functionalization be approved.

7. That generation demand costs be allocated to the Island Interconnected System using a coincident peak allocator.

8. That a 1 CP allocator be approved for interim use in the Island Interconnected System and that Hydro present to the Board at the time of its next rate hearing an analysis of the relationship between load factor and system reserve requirement, together with a recommendation regarding the number of peaks on which the CP allocator for generation demand costs should be based.

9. That a proportion of hydraulic plant costs in the Island Interconnected System equal to the annual system coincident load factor be classified as energy-related and the balance be classified as demand-related.

10. That a proportion of Holyrood generating station plant costs equal to the average of the plant capacity factor in the preceding five years be classified as energy-related and the balance be classified as demand-related.

11. That all plant costs relating to gas turbine and diesel generation in the Island Interconnected System be classified as demand-related.

12. That costs of gas turbine and diesel fuel in the Island Interconnected System be classified to demand and that variable operating costs and all other fuel costs be classified to energy.

13. That Hydro's proposed method of allocating energy costs be approved.

14. That Hydro examine the practicality of attributing system energy losses to rate classes on a time-differentiated basis and report its conclusions as to both practicability and impact on allocated costs at the time of its next rate referral.

15. That transmission lines and substations in the Island Interconnected System used solely or dominantly for the purpose of connecting remotely-located generation to the main transmission system be classified in the same manner as the generating stations they serve.

16. That all other transmission be classified 100% to demand.

17. That sub-transmission be classified in the same manner as recommended in Recommendations 15 and 16.

18. That transmission and sub-transmission costs in the Island Interconnected System be allocated by means of a 1 CP allocator.

19. That Hydro's proposed classification of distribution cost be accepted for interim use and that Hydro prepare a revised study of distribution cost for presentation to the Board at the time of its next rate referral.

20. That Hydro's method of allocating distribution cost be approved.

21. That subject to the provisions of Recommendation 19, Hydro's proposed methodology be approved for the Labrador Interconnected and Rural Isolated Systems.

22. That for cost of service purposes Hydro include the NP mobile gas turbine as part of NP's gross generation before adjusting for reserve capacity.

23. That the approach illustrated in Exhibit GCB-5 (Appendix 1 of this Report) is recommended for the allocation of the rural deficit for the purpose of the cost of service.

24. That Hydro's proposed provision be included in the RSP along with a mathematical equation with all variables defined, which explains how automatic adjustments are to be calculated. The provision should be included in Hydro's Rules and Regulations.

25. That except where a different approach is specifically recommended in this report, Hydro's cost of service methodology be approved as submitted.

26. That the cost of service methodology recommended herein be adopted by Hydro for the purpose of its next rate referral.

APPENDIX 1 (EXHIBIT GCB-5)

EXHIBIT GCB-5.1

1. CLASSIFICATION OF DEFICIT

(Classified Allocated Costs Before Deficit Allocation

	CLASS	(1) TOTAL $	(2) DEMAND $	(3) ENERGY $	(4) CUSTOMER $	SOURCE (RAB-1 Schedule)
1.	NLP	175,286,264	114,823,391	58,218,885	2,243,988	1.3.1(P1)
2.	Island Industrial	37,164,834	19,091,933	17,104,784	968,117	1.3.1(P1)
3.	Lab. Intercon.	13,401,357	10,470,416	1,408,487	1,522,454	1.3.1(P3)
4.	Total	225,852,455	144,385,740	76,732,156	4,734,559	
5.	Deficit prorated	28,487,316	18,211,723	9,678,412	597,181	Prorated on li 4

2. UNIT COSTS OF DEFICIT

(Demand, Energy & Customer Totals)

	CLASS	DEMAND AED KW	ENERGY MWh	CUSTOMER* Equivalent Unweighted	
6.	NLP	977,031	4,397,884	9,574	3.1A & 3.2A
7.	Island Industrial	166,911	1,292,104	4,131	3.1A & 3.2A
8.	Subtotal, Island	1,143,942	5,689,988	13,705	
9.	DND	21,236	141,298	484	3.1C & 3.2C
10.	10CC	38,409	243,051	--	3.1C
11.	Labrador Rural	111,624	485,366	7,560	3.1C & 3.2C
12.	Subtotal, Labrador	171,269	869,715	8,044	
13.	Total	1,315,211	6,559,703	21,749	
14.	Deficit unit costs	13.84700/KW	$1.47543/MWh	$27.458 /cust.	Li 5/li 13

*Specifically assigned costs are converted to equivalent unweighted customers by dividing the assigned cost by the allocated customer cost per unweighted customer ($234.38 Island & $189.28 Labrador).

EXHIBIT GCB-5.2

3. ALLOCATION OF DEFICIT

	ISLAND $	LABRADOR $
Demand cost		
$13.847/KW x 1,143,942 KW	15,840,162	
x 171,269 KW		2,371,561
Energy		
$1.47543 x 5,689,988	8,395,204	
x 869,715		1,283,208
Customer		
$27.458 x 13,705	376,310	
x 8,044		220,871
ALLOCATED TOTALS:	24,611,676	3,875,640

Notes:

1. Unit costs are taken from GCB-5.1, line 14. Quantities are taken from GCB-5.1, line 8 for Island and line 12 for Labrador.

2. The allocated totals should be prorated on allocated costs of the subsidizing classes within each cost of service.

NEWFOUNDLAND AND LABRADOR HYDRO
2013 Test Year Cost of Service
Functionalization & Classification Ratios

Line No.	1 Description	2 Total Amount (%)	3 Production Demand (%)	4 Production & Transmission Energy (%)	5 Transmission Demand (%)	6 Rural Prod & Transmission Demand (%)	7 Distribution Substations Demand (%)	8 Basis of Functional Classification	9 Report of the Board February 1993
	Generation								
1	Hydraulic	100%	44.61%	55.39%				System load factor, calculated on COS Schedule 4.2	p. 75, #9
2	Hydraulic - GNP	100%	44.61%	55.39%		0.0%		System load factor, Schedule 4.2	p. 75, #9
3	Holyrood	100%	77.66%	22.34%				Holyrood Capacity Factor, calculated on COS Schedule 4.3	p. 75, #10
4	Gas Tur Island Intercnctd	100%	100.00%	0.00%				Five-year average plant capacity factor, Schedule 4.3	p. 75, #12
5	Diesel Island Intercnctd - GNP	100%	100.00%	0.00%		0.0%			p. 75, #12
6	Dsl / Gas Tur Island Isolated	100%	43.08%	56.92%				System load factor, Schedule 4.2	p. 77, #21
7	Dsl / Gas Tur Labrador Isolated	100%	34.47%	65.53%				System load factor, Schedule 4.2	p. 77, #21
8	Dsl / Gas Tur L'Anse au Loup	100%	100.00%	0.00%					p. 77, #21
9	Dsl / Gas Tur Labrador Intercnctd	100%	100.00%	0.00%					p. 77, #21
	Fuel								
10	No. 6 Fuel	100%	0.00%	100.00%					p. 75, # 12
11	Gas Tur Island Intercnctd	100%	100.00%	0.00%					p. 75, # 12
12	Diesel Island Intercnctd - GNP	100%	100.00%	0.00%		0.0%			p. 75, # 12
13	Dsl / Gas Tur Island / Lab Isolated	100%	0.00%	100.00%					p. 77, #21
14	Dsl / Gas Tur L'Anse au Loup	100%	0.00%	100.00%					p. 77, #21
15	Dsl / Gas Tur Labrador Intercnctd	100%	100.00%	0.00%					p. 77, #21
	Transmission Lines & Terminals								
16	Lines	100%		0.00%	100%				p. 76, # 16
17	Lines - Hydraulic	100%	44.61%	55.39%				System load factor, Schedule 4.2	p. 76, # 15
18	Lines - Customer Specific	100%						100% specifically assigned	
19	Terminal Stations	100%		0.00%	100%				p. 76, # 16
20	Term Stns - Hydraulic	100%	44.61%	55.39%				System load factor, Schedule 4.2	p. 76, # 15
21	Term Stns - Holyrood	100%	77.66%	22.34%				Five-year average plant capacity factor, Schedule 4.3	p. 76, # 15
22	Term Stns - Gas Tur	100%	100%						p. 76, # 15
23	Term Stns - Diesel GNP	100%	100.00%	0.00%		0.0%			p. 76, # 15
24	Terminal Stations - Distribution	100%					100%	Refer to Schedule 4.1, page 2, L28	
25	Term Stns - Custmr Specific	100%						100% specifically assigned	
26	Rural Lines	100%				100.0%			p. 76, # 17
27	Rural Terminal Stations	100%				100.0%			p. 76, # 17